## REMARKS

**Amendments Made to the Claims**

Claims 28 to 36 previously withdrawn from consideration have now been cancelled.

Claim 1 has been amended by the incorporation of the feature of original claim 2, and claim 2 has consequently been cancelled.

Similarly, claim 14 has been amended to incorporate the feature of original claim 15 and claim 15 has consequently been cancelled.

All of the claims of this application now require the casting surface to have a specified degree of surface roughness in the range of 18-80 micro-inches.

Also, claims 21 and 27 have been amended to correct typographical errors, and claims 21 and 22 have been amended to more clearly recite employing a casting surface with grooves having the recited orientation.

**Claim Rejections - 35 USC § 102(e)**

The Examiner rejected claims 1, 5, 7-10, 13, 14, 18, 20-24 and 27 as directly anticipated by US 6,581,675 to Harrington.

As indicated above, all of the claims have now been amended to include the features of claims 2 and 15. Since claims 2 and 15 were not included in the rejection under Section 102, it is believed that the Examiner's objection has been overcome.

**Claim Rejections - 35 USC § 103(a)**

The Examiner rejected claims 2-4 and 15-17 as being unpatentable over Harrington and further in view of US 2004/0045696 to Marti et al. This rejection is believed to be incorrect for the following reasons.

First of all, it is mentioned that the inventors of the present invention made the surprising discovery that substantially orientated grooves provided in a casting surface improve the heat distribution within the casting cavity as compared to a casting surface having random surface characteristics. When the surface roughness is within the range now introduced into claims 1 and 14, an improved heat distribution is achieved without causing certain defects to appear in the cast slab. This is explained in the description on page 9, line 20 to 26 of the present application, where it is stated:

> "It has been found that, if the roughness ($R_a$) of the belt is less than about 18 micro-inches (0.46 micrometers), the meniscus becomes unstable resulting in surface defects, and the interior of cast strip suffers from porosity and other casting defects. If the roughness of the belt exceeds 80 micro-inches, the surface of cast strip has exposed dendrites (referred to as "frost") or exudates (referred to as "blebs"), although the interior of the slab may be sound."

This finding is neither disclosed nor hinted at in any of the references cited by the Examiner.

The Examiner stated that Harrington "substantially shows the invention as claimed except that he does not show the roughness of the belt surface". Harrington merely mentions that one or more of the belts may have longitudinal grooves on the surface of the belt in contact with the metal being cast (column 8, lines 29-33). As noted by the Examiner, the surface roughness thereby imparted is not specified. However, Harrington states:

"Such grooves have been used in single drum casters as described in U.S. Pat. No. 4,934,443 and WO 09714520A."

Copies of these references are attached for the Examiner's review.

US 4,934,443 states, at Column 8, lines 57 and 58, that the grooves on the casting roll "may have a depth of from about 0.025 to about 0.60 millimeters", i.e. 25-600 microns. The accepted function of grooving or cross-hatching is stated at column 3, lines 14-23 and is to avoid trapping air and gases between the metal and the casting surface. The lower limit of the stated range of this reference (0.025 mm) is an order of magnitude higher than the maximum $R_a$ value (2.0 micrometers) now specified in the claims of the present application.

WO 97/14520 states, on page 15, first full paragraph from the top, that grooves (in a steel strip casting belt) will typically have a depth of from 1 to 40% of the thickness of the belt. In the first paragraph on page 13, this thickness is stated as 0.05 to 0.15 inch. One percent of 0.05 inch is 500 micro-inches, which is more than 6 times larger than the maximum (80 micro-inches) now specified for the present invention.

Clearly, if Harrington was using these two prior references as a guide for grooving the casting surface, he would not have contemplated a surface roughness in the range now specified for the present invention. Moreover, Harrington does not give a reason for providing longitudinal grooves on the surface of the belt, and those mentioned in the references specified above are different

from the reason underlying the present invention.

The Examiner went on to say that "Marti et al. show (see, for example, [0021]) that it is desirable to provide a casting surface having a surface roughness of at least micrometer to obtain a strip having a better surface quality."

Marti et al. disclose a twin-roll strip casting machine having a cylindrical surface "which is smoothly formed, preferably with a surface roughness of less than 6 micrometers, and especially less than 1 micrometer" as formed by grinding or turning. The Examiner maintains that this makes up for the lack of any indication in Harrington of the degree of surface roughness. However, the statement made by Marti et al. concerning the surface roughness of less than one micrometer is contained in paragraph [0021], which refers to Fig. 3 and states:

> Fig. 3 shows an enlarged section of a cylindrical surface, which is smoothly formed, preferably with a surface roughness of less than 6 micrometers, and especially less than 1 micrometer, and therefore has been fine machined by grinding or turning. In addition, the base material A is provided with a layer of material B, which preferably consists of nickel, steel, and/or chromium. The layer of material B and the layer of material C are applied by a thermal spraying process, for example, plasma spraying or flame spraying, by HIP cladding, or by another coating method, for example, electrolysis.

It appears that the statement regarding surface roughness

applies to layer A, which is then coated with layers B and C, so the casting surface itself (outer surface of layer C) does not have the stated degree of roughness. Layer C is first mentioned in connection with Fig. 2 and it is stated in paragraph [0015] that:

> This ceramic layer C applied to the base material A has depressions 51 in the micrometer range distributed over its entire surface, which can be produced, for example, by grit blasting or laser roughening. These depressions result in an indicated heat transfer $\phi$, which manifests itself in a sawtooth-shaped curve.

The "depression 51", if produced by grit blasting or laser roughening, would not be grooves orientated substantially in the same direction as required by the claims of the present application. This is probably why they are referred to as "depressions" rather than "grooves". Also, comparing Figs. 2 and 3, it is apparent that the depressions of Fig. 2 are filled in Fig. 3 with particles of a different ceramic C1 embedded in ceramic C2. The surface of Fig. 3 therefore appears flat and is without depressions.

It should also be noted that Marti et al. provides a film of an inert gas G between the metal being cast and the casting surface. This is done to overcome a problem of providing casting surface with depressions measuring up to 100 micrometers previously used to form gas bubbles (see paragraph [0002]). The teaching of Marti et al. is therefore that you can provide such depressions or not (paragraph [0004]) without the accompanying problems provided that an inert gas film is introduced between the metal and the casting surface. The implication is, therefore, that the use of

depressions without such a film gives rise to problems (roughness of cast metal surface, accumulation of dirt, etc.) and is thus to be avoided. In this sense, therefore, Marti et al. teach away from the provision of depressions on the casting surface if a film of gas is not additionally provided.

Given that Marti et al. and Harrington appear to operate in different ways, there would be no justification in combining the teachings of these two references in the manner suggested by the Examiner. Reconsideration is therefore requested.

The Examiner also rejected claims 11, 12, 25 and 26 as unpatentable over Harrington, and further in view of US 5,636,681 to Sulzer et al. Reconsideration of this rejection is requested.

As noted above, all claims of this application are now limited to the features of former claims 2 and 15 and since original claims 2 and 15 were not included in this rejection, it would seem that the rejection no longer applies to the amended claims.

The Examiner also provisionally rejected claims 6 and 19 over co-pending application Serial No. 10/574,459 in view of Harrington. Since claims 2 and 15 were not included in this provisional rejection, it is believed that this objection no longer applies to the amended claims. That is to say, claims 6 and 19 have now been amended to include the features of original claims 2 and 15, and the incorporation of these features overcomes the relevance of Harrington.

In view of the amendments and comments made above, favorable reconsideration of this application is requested.

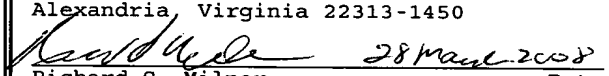
If a telephone interview would be of assistance in advancing prosecution of the subject application, applicants' undersigned attorney invites the Examiner to telephone him at the number provided below.

No fees, other than the fee for a one-month extension of time and the fee for the Supplemental Information Disclosure Statement, are deemed necessary in connection with the filing of this Amendment. However, if any such fees are required, authorization is hereby given to charge the amount of any such fees to Deposit Account No. 03-3125.

Respectfully submitted,

Richard S. Milner
Registration No. 33,970
Attorney for Applicants
Cooper & Dunham LLP
1185 Avenue of the Americas
New York, New York 10036
(212) 278-0400

I hereby certify that this paper is being deposited this date with the U.S. Postal Service as first class mail addressed to:
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450



28 March 2008
Richard S. Milner Date
Reg. No. 33,970